

**GREN**  
Global Research &  
Education Network

## GREN Map Working Group

GNA-G Update December 2020

# Objective

- A single unified map: a visual representation of Research & Education Network connectivity over the entire GREN.
- Primary goal: demonstrate the REN value proposition to all stakeholders.
- Current and previous efforts are limited in one way or another: onerous, incomplete, stale, static, isolated, technical, ...
- Demand is high!



# GREN Mapping Working Group

- Formed in the fall of 2018
- Enjoys participation from a wide variety of regions
- Meets roughly bi-weekly; English as primary language
- Reports to the GNA-G
- Guides the following primary objectives...

## Composition of the Working Group

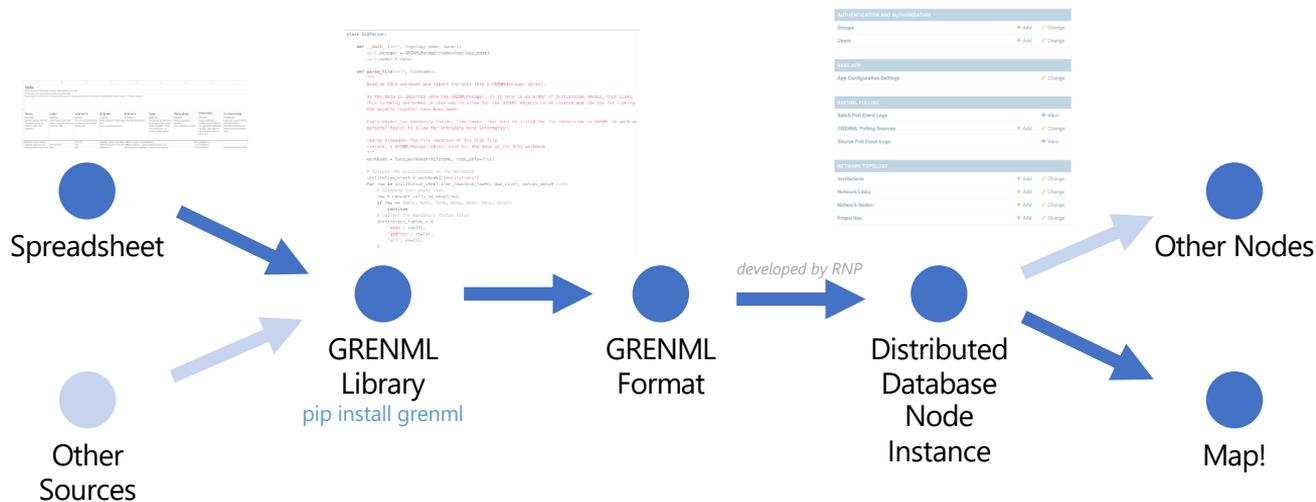
- Chairs:
  - Ryan Davies, CANARIE
  - Tom Fryer, GÉANT
- Members (26 including chairs):
  - CANARIE (4)
  - RNP (4)
  - NODRUnet (3)
  - RedCLARA (3)
  - UbuntuNet (2)
  - APAN (1)
  - ESnet (1)
  - Indiana University (1)
  - Internet2 (1)
  - REANNZ (1)
  - RENATER (1)
  - University of Amsterdam (1)
  - WACREN (1)

# Working Group Guiding Goals

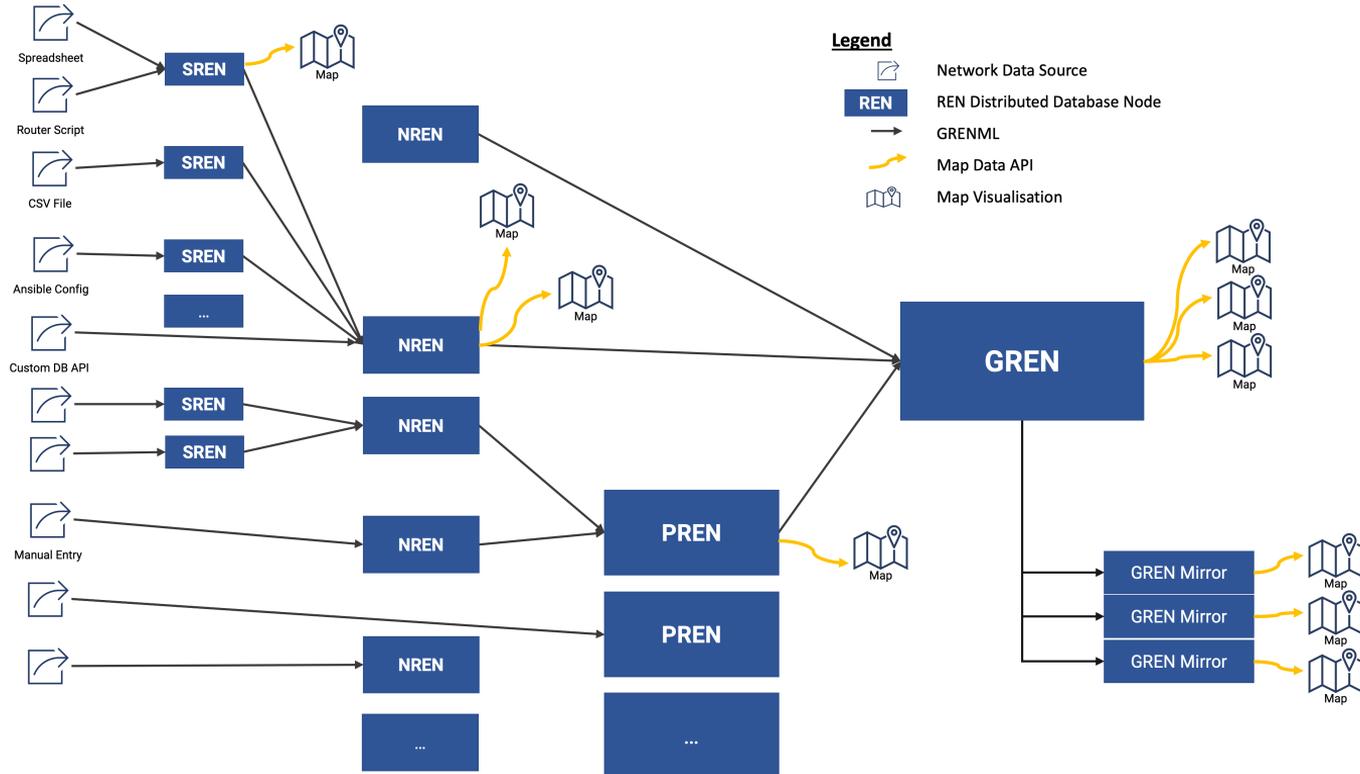
- Develop a data format and schema
- Encourage wide participation to achieve critical mass adoption of the above format
- Develop tools to help RENO transition/translate to the data format
- Develop a distributed database system to
  - store and manage this information
  - consolidate into a single node
- Develop a reference visualisation

# Tool Support: Development Progress

- Development effort led by CANARIE, with contributions from RNP.
- Alpha versions of all bold items below are available.
  - Lighter items are in progress or on near-future roadmap.
- Licensed under Apache 2.0, code hosted by CANARIE.
  - Considering Commons Conservancy for release.



# Distributed Database Architecture



# Data Format: Working Draft

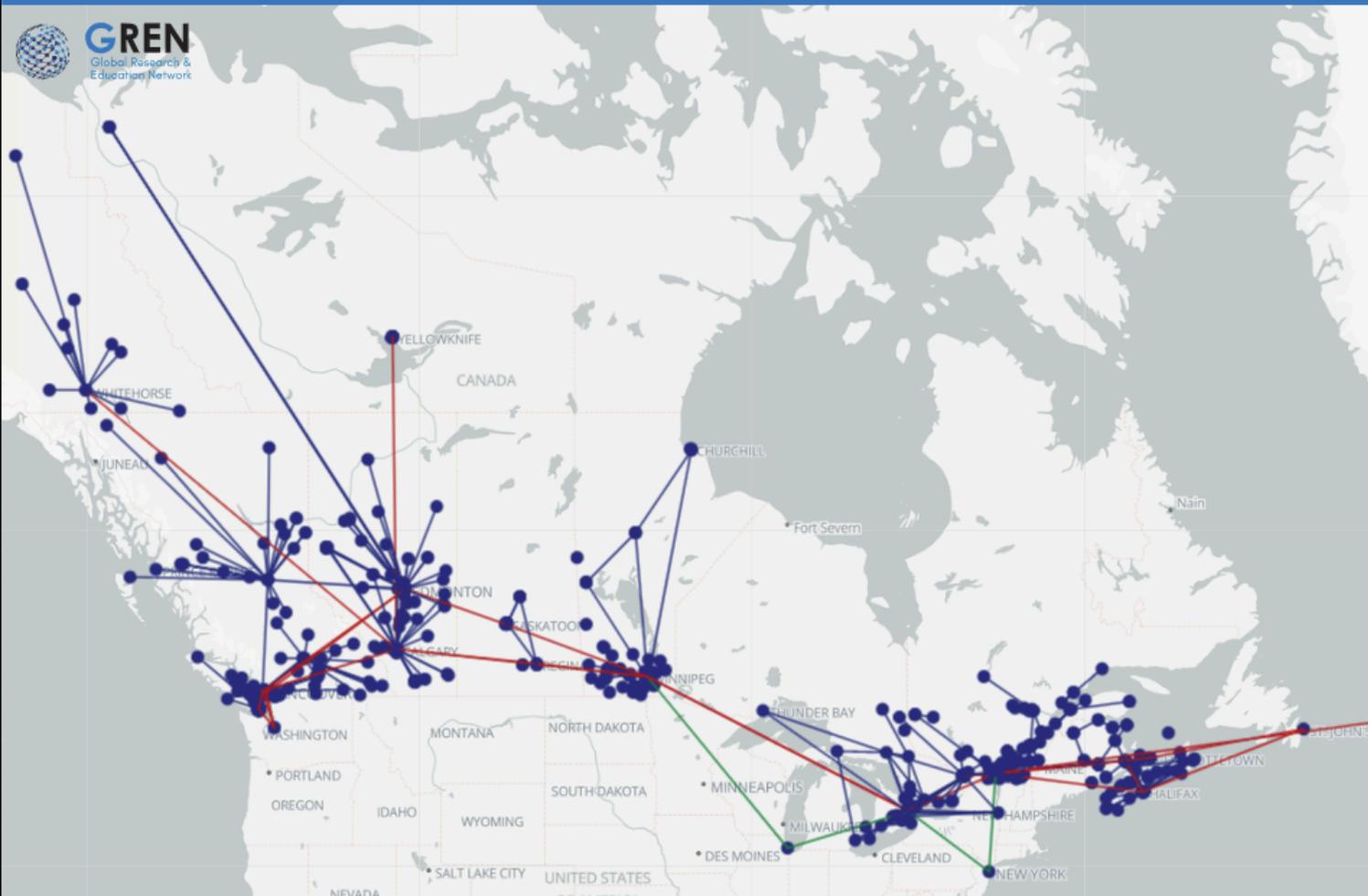
- To support the streamlined sharing of network data for visualising the GREN
- Requirements extrapolated from features identified by this working group
- Basis: NML — Network Markup Language (XML)
  - Maintained by the Open Grid Forum
  - Meets many requirements
- Extension: “GRENML”
  - Added features
    - focus on visual mapping
  - Conveniences
    - support easier translation to/from the format

# Demo Visualisation

- Showcases the use of the data format
- Serves as an example starting point for custom maps
- Javascript package that connects to any distributed database node
  - GREN level (including mirrors)
  - SREN, NREN, PREN levels
- Basic functionality
  - Nodes, links, zoom, infinite scroll, info popup
- Embeddable

# Canadian NREN Map

- Objective: to show, dynamically and in detail:
  - The CANARIE backbone network, including many external links
  - The provincial & territorial networks
- Another objective:
  - Use the GREN Map infrastructure
- Status:
  - Data from all networks collected and imported
    - First round of refinement complete
    - One more round of refinement before launch
  - Partial automation of data collection by two provincial networks!
    - Using the library to generate GRENML directly!



**Link Details** ✕

**MTRL2-TOR01**  
↻ CANARIE ↻ 200 Gbps

- Connected to:**
- Toronto Location 1 Router
  - Montreal Location 2 Router

**Managed by:**

CANARIE Inc. ^

~ NREN

🌐 [www.canarie.ca](http://www.canarie.ca)

# Tool Support Roadmap

- Release sandbox version for alpha release
  - Help us! Volunteer to deploy it.
- Security
- Launch a production instance for the Canadian NREN Map
- Hierarchical data collation algorithms
- Multi-language support
- Visualisation features: branding, defaults, performance, filters, ...

# Next Steps

- Seek early adopters:
  - Gather more initial source data & sources
  - Deploy “sandboxed” database node for alpha testing
  - Collect feedback
- Recruit more software development support
- Establish some conventions
  - Web registry
- Global map
  - Core functionality
  - Some initial diverse global data — work with us by providing yours!
  - Summer 2021

# Contact

For questions, or to get involved, please contact one of our working group chairs:

Ryan Davies

[Ryan.Davies@canarie.ca](mailto:Ryan.Davies@canarie.ca)

Tom Fryer

[tom.fryer@geant.org](mailto:tom.fryer@geant.org)

Especially seeking:

- Network mapping data for your REN
- Early adoption of alpha software
- Software development support